

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A synthetic fatty acid desaturase gene for expression in a multicellular plant, the gene comprising SEQ ID NO:3 ~~a desaturase domain of a fatty acid Δ -9 desaturase and a cyt b₅ domain~~, wherein the gene is customized from a naturally occurring cytosolic Δ -9 desaturase gene from *Saccharomyces cerevisiae* for expression in a plant cytoplasm.

2-6. (Canceled)

7. (Original) The synthetic gene of claim 1, which further comprises an expression regulatory sequence from a plant gene encoding an ER biosynthetic pathway enzyme.

8. (Original) The synthetic gene of claim 1, customized for expression in a monocotyledonous plant.

9. (Original) The synthetic gene of claim 1, customized for expression in a dicotyledonous plant.

10. (Original) The synthetic gene of claim 1, customized for expression in a plant genus selected from the group consisting of *Arabidopsis*, *Brassica*, *Phaeseolus*, *Oryza*, *Olea*, *Elaeis* (Oil Palm) and *Zea*.

11. (Original) The synthetic gene of claim 1, customized from a naturally occurring gene comprising both a desaturase domain and a cyt b₅ domain.

12. (Original) The synthetic gene of claim 1, wherein the gene is a chimeric gene comprising a desaturase domain and a heterologous cyt b₅ domain.

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13. (Original) The synthetic gene of claim 1, customized from a naturally occurring gene such that the synthetic gene and the naturally occurring gene encode an identical amino acid sequence.

14. (Original) The synthetic gene of claim 13, wherein the synthetic gene and the naturally occurring gene encode SEQ ID NO:2.

15. (Original) The synthetic gene of claim 1, customized from a naturally occurring gene such that the synthetic gene and the naturally occurring gene encode a similar amino acid sequence.

16. (Original) The synthetic gene of claim 1, customized from a naturally occurring gene such that the synthetic gene and the naturally occurring gene encode a similar amino acid sequence, and the synthetic gene possesses improved stability or catalytic activity as compared with the naturally occurring gene.

17 - 21. (Canceled)